Environmental Impact Statement For A Proposed Repository

At Yucca Mountain, Nevada

Summary of Public Scoping Comments

Related to the

Environmental Impact Statement

for a Geologic Repository for the Disposal

of Spent Nuclear Fuel and High-Level Radioactive Waste

at Yucca Mountain, Nye County, Nevada

May 1997
U.S. Department of Energy
Yucca Mountain Site Characterization Office

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Appendix A SUMMARY OF SCOPING COMMENTS BY CATEGORY

ACRONYMS

CFR - Code of Federal Regulations

DOE - Department of Energy

EIS - Environmental Impact Statement

FR - Federal Register

HLW - high-level radioactive waste

MTHM - metric tons of heavy metal

NEPA - National Environmental Policy Act

NTS - Nevada Test Site

NWPA - Nuclear Waste Policy Act

SNF - spent nuclear fuel

1. INTRODUCTION

1.1 PURPOSE AND ORGANIZATION OF THE DOCUMENT

The U. S. Department of Energy (DOE) is evaluating in the *Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* [Repository Environmental Impact Statement (EIS)] the proposal to construct, operate, and permanently close a geologic repository [*Federal Register* (FR) 1995a]. This comment summary document summarizes comments and issues identified during the public scoping process and indicates the general approach for addressing issues in the Repository EIS.

Section 1 describes the history and scope of the Repository EIS, the alternatives being evaluated in the EIS, and related National Environmental Policy Act (NEPA) reviews. Section 2 summarizes the major issues identified during the public scoping process for the Repository EIS and describes a general approach for what will be addressed in the EIS. Appendix A contains comment summaries compiled by DOE based on the public comments received during the public scoping process for the Repository EIS.

On July 9, 1996, DOE published a final rule in the *Federal Register* that, among other things, eliminated the requirement to prepare an implementation plan [formerly in Section 1021.312 of DOE NEPA regulations at 10 Code of Federal Regulations (CFR) Part 1021]. This change was made to simplify the DOE NEPA process, reduce cost, and save time. The elimination of the implementation plan does not, however, relinquish the requirement to consider public scoping comments and factor them into the preparation of an EIS. This document summarizes and categorizes comments received during the public scoping process into issue areas to discuss what issues will be addressed in the EIS. The intent is not to provide a direct response to every question that was asked during the public scoping period. Preparation of this document fulfills DOE's commitment, made during the EIS scoping process, to inform the public of the outcome of that process.

1.2 BACKGROUND

The Nuclear Waste Policy Act of 1982, as amended, (NWPA) directs the DOE to evaluate the suitability of the Yucca Mountain site in southern Nevada as a potential site for development of a geologic repository for the disposal of spent nuclear fuel (SNF) and high-level radioactive waste (HLW). If the Secretary of Energy determines that the Yucca Mountain site is suitable, the Secretary may then recommend that the President approve the site for development of a repository. Under the NWPA, such a recommendation must be accompanied by a Final EIS. Therefore, DOE is preparing the Repository EIS to support a potential recommendation for development of a repository at Yucca Mountain. The NWPA also directs the Nuclear Regulatory Commission to adopt DOE's Repository EIS, to the extent practicable, in connection with any

subsequent construction authorization and license that the Commission issues to DOE for the repository.

As discussed in the Notice of Intent, the proposed action is to construct, operate, and eventually close a repository at Yucca Mountain for the geologic disposal of 63,000 metric tons of heavy metal (MTHM) of commercial SNF and 7,000 MTHM of DOE SNF (includes SNF from the Navy Nuclear Propulsion Program) and HLW (FR 1995a). The NWPA states that the EIS does not have to discuss the need for a repository, alternatives to geologic disposal, or alternative sites to Yucca Mountain. DOE identified three alternatives to implement the proposed action based on thermal load objectives; namely, a high thermal load, an intermediate thermal load, and a low thermal load. For each implementing alternative, packaging and transportation options will also be considered.

During the scoping period, DOE received many comments noting the existence of SNF and HLW in excess of 70,000 MTHM, and encouraging DOE to evaluate the total projected inventory of SNF and HLW. In addition, some commentors requested that the EIS evaluate the disposal of other highly radioactive waste types that may require permanent isolation, consistent with related DOE NEPA reviews and other DOE planning documents. Other commentors noted that DOE has a responsibility to start accepting waste shipments prior to the projected 2010 start of repository operations.

Based on the comments received, DOE is considering presenting incremental analyses for the disposal of all projected SNF and HLW, as well as other highly radioactive waste types that may require permanent isolation, and/or incremental analyses for receipt of waste at Yucca Mountain prior to full operation of the repository. It should be noted that any DOE decisions based in part on analyses presented in the Repository EIS must be consistent with the provisions of the NWPA and other applicable law. In addition under the NWPA, the Nuclear Regulatory Commission decision approving the first repository license application shall prohibit the emplacement in the first repository of more than 70,000 MTHM of SNF and HLW, until such time as a second repository is in operation.

Figure 1-1 provides a timeline representation of the current schedule for preparation of the Repository EIS.

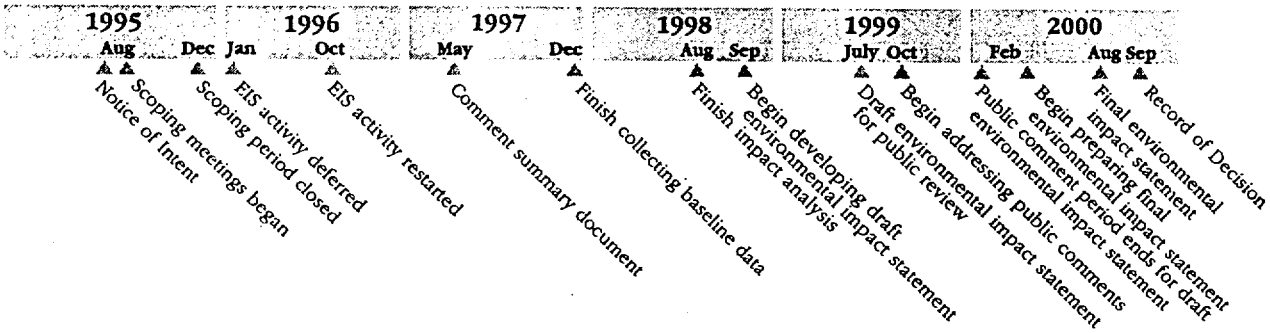

Figure 1-1. Repository EIS Timeline

1.3 ALTERNATIVES TO BE EVALUATED IN THE REPOSITORY ENVIRONMENTAL IMPACT STATEMENT

The proposed action is to construct, operate, and eventually close a repository at Yucca Mountain for the geologic disposal of 63,000 MTHM of commercial SNF and 7,000 MTHM of DOE SNF and HLW. Four alternatives will be evaluated: three alternatives to implement the proposed action and the No Action alternative. The implementing alternatives will be based on thermal load objectives: a high thermal load that considers the emplacement of more than 80 MTHM per acre, an intermediate thermal load of between 40 and 80 MTHM per acre, and a low thermal load of less than 40 MTHM per acre. Each of the thermal loads would produce different underground configurations for the subsurface repository. The configuration would change in size and layout to accommodate emplacement of the waste (i.e., lower thermal loads would require larger underground areas because the waste would be more widely spaced.)

As part of each implementing alternative, two packaging options will be evaluated. Under Option 1, SNF assemblies would be packaged and sealed in multi-purpose canisters at the generator sites prior to being transported in casks to the repository. HLW would be packaged and sealed in canisters prior to shipment in similar casks. Under Option 2, SNF assemblies (without canisters) and sealed canisters of HLW would be transported in casks to the repository.

For each implementing alternative, five transportation options will also be evaluated: two national and three regional (i.e., within the state of Nevada). The first national option would be to ship nuclear fuel and HLW by truck, from the generator site to the repository. The second national option would be to ship by rail, except from those generator sites that do not have access to an existing rail line. For the three regional transportation options, two apply to shipments that would arrive in Nevada by rail, and the third applies to shipments that would arrive in Nevada by truck. The first regional transportation option would be to ship by rail to the repository. The second regional transportation option would be to ship by rail to an intermodal transfer facility for transfer to heavy haul trucks, which would then transport the shipments to the repository. The third regional transportation option would be to use legal weight trucks to ship from the generator sites directly to the repository.

As noted above, based on comments received, DOE is considering evaluating expanded inventory "modules" in the EIS to analyze the disposal of all projected SNF and HLW, as well as other highly radioactive waste types that may require permanent isolation. DOE is also considering evaluating receipt of waste at Yucca Mountain prior to full operation of the repository.

Under the No Action alternative, a geologic repository at the Yucca Mountain site would not be constructed. SNF and HLW would continue to accumulate at the 75 commercial nuclear reactor sites and at DOE facilities. The existing tunnel excavation equipment and facilities at the Yucca Mountain site (for example, the Exploratory Studies Facility and support facilities) could be reclaimed, dismantled and removed for reuse, recycling, or disposal as appropriate .

The No Action alternative will be analyzed by evaluating a generic commercial nuclear reactor site and continued storage of waste at DOE facilities. The commercial site and DOE facilities would continue to operate for 100 years to ensure public health and safety. After 100 years, it is assumed that institutional control would be lost. Storage containers at commercial sites would be routinely monitored for corrosion and repackaged as necessary to comply with safety requirements. The DOE-owned SNF and HLW would continue to be stored at the Hanford Site, the Idaho National Engineering and Environmental Laboratory, and the Savannah River Site. It is assumed storage facilities at DOE sites would be upgraded or built as necessary.

The impacts to the environment at commercial nuclear sites will be assessed generically using existing environmental documentation prepared for license applications for these commercial facilities. The impacts will be assessed for two periods of time. The first time frame would be equivalent to the preclosure phase (disposal and caretaker) at the Yucca Mountain site (up to 100 years) and for purposes of analysis it will be assumed that institutional controls, such as monitoring and maintenance, would be maintained. The second time frame would, for purposes of analysis only, consider a long-term loss of institutional control, and would parallel the 100 year analysis period for the action alternatives.

1.4 RELATED NEPA REVIEWS

The DOE and other federal agencies (i.e., the Department of Defense) have completed, are in the process of preparing, or anticipate preparing NEPA documents that could affect the scope of this EIS. The actions under evaluation in these NEPA documents relate primarily to ongoing and proposed defense waste management, environmental restoration, non-defense research and development, and work for other DOE programs as well as non-DOE actions proposed by other federal agencies. These EISs are briefly described below.

The *Environmental Assessment, Yucca Mountain Site, Nevada Research and Development Area, Nevada*, DOE/RW-0073, evaluated the Yucca Mountain in accordance with the DOE's General Guidelines for the Recommendations of Sites for the Nuclear Waste Repositories and found Yucca Mountain suitable for site characterization (DOE 1986).

The Yucca Mountain site lies partly on and partly adjacent to the Nevada Test Site (NTS). As such, proposed actions at the NTS could affect the scope of the Repository EIS. The *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada*, DOE/EIS-0243, identifies a preferred alternative where the NTS would be made available for increased use by DOE to support national defense and nondefense programs (DOE 1996a). The preferred alternative reflects the need to maintain readiness to conduct nuclear-weapons tests, to manage a variety of radioactive wastes, and to restore parts of the NTS that have been contaminated by past DOE activities. Under the preferred alternative, the use of the NTS for other defense purposes would expand, and technological innovation in both the public and private sectors (e.g., to develop economical solar power) would also be encouraged. The Repository EIS will factor plans for increased usage at the NTS into the analysis of cumulative

effects. For example, the combined effects of transporting various radioactive materials to both the repository and to the NTS will be considered in the analyses of cumulative impacts in the Repository EIS.

The *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Environmental Impact Statement*, DOE/EIS-203-F, analyzed the potential environmental consequences of managing DOE's inventory of SNF over the next 40 years (DOE 1995a). The Record of Decision states that SNF will be managed by fuel type at three DOE sites: the Hanford Site, the Idaho National Engineering Laboratory and the Savannah River Site. The Repository EIS will evaluate both the transportation to and the emplacement of this SNF in the geologic repository at Yucca Mountain.

The Record of Decision for the *Final Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel*, DOE/EIS-0218F, states that aluminum-based and TRIGA (Training, Research, Isotope, General Atomics) foreign research reactor SNF and target material containing uranium enriched in the United States will be accepted into this country to support the United States' nuclear weapons nonproliferation policy (FR 1996a). The aluminum-based SNF and the target material will be processed at the Savannah River Site for ultimate geologic disposal. The TRIGA SNF will be stored at the Idaho National Engineering Laboratory prior to ultimate geologic disposal. The potential shipment of this foreign research reactor SNF from both the Savannah River Site and the Idaho National Engineering Laboratory to the Yucca Mountain site for ultimate disposal will be evaluated in the Repository EIS.

The *Department of the Navy Final Environmental Impact Statement for a Container System for the Management of Naval Spent Nuclear Fuel*, evaluates alternatives that would provide a system of containers for managing Naval SNF following examination at the Idaho National Engineering Laboratory, prior to potential shipment to Yucca Mountain (U.S. Navy 1996). The Navy has estimated between 300 to 500 container shipments to the proposed repository would occur between the years 2010 and 2035 depending on the alternative selected. The addition of special case waste would increase the number of containers under any alternative by about 15 to 20 percent. The potential shipment of this SNF to Yucca Mountain will be included in the analysis of transportation impacts in the Repository EIS.

The *Draft Waste Management Programmatic EIS*, DOE/EIS-0200-D, is a nationwide study that analyzed the environmental impacts of managing five types of radioactive and hazardous waste, including HLW, from nuclear weapons production and related activities (DOE 1995b). The NTS was identified as a potential site for the disposal of low-level waste and low-level mixed waste; and for the treatment and storage of transuranic waste. The Waste Management Programmatic EIS also evaluated the storage of HLW prior to its potential shipment to Yucca Mountain. If the NTS were chosen as a disposal site for low-level waste and low-level mixed waste and for the storage of transuranic waste, the transportation of these wastes to the NTS will be considered in the analysis of cumulative impacts in the Repository EIS. The

shipment of HLW from DOE storage sites for disposal at Yucca Mountain will also be evaluated in the Repository EIS.

The *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement,* DOE/EIS-0189, August 1996, was jointly prepared by DOE and the Washington State Department of Ecology (DOE 1996b). This EIS evaluated alternatives to manage and dispose of Hanford Site tank waste and encapsulated cesium and strontium. For purposes of analysis, the Tank Waste EIS assumed that up to 7,100 HLW canisters (1,800 Hanford multi-purpose canisters) of material would satisfy the potential repository's acceptance criteria and could be placed in a geologic repository at Yucca Mountain. Any decisions on management of cesium and strontium capsules have been deferred.

The *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement,* DOE/EIS-0229, analyzed the potential consequences of alternatives for the long-term storage (up to 50 years) and disposition of weapons-usable fissile materials from U. S. weapon dismantlements under the responsibility of DOE (DOE 1996c). This EIS evaluated technologies for long-term storage at six DOE candidate sites including the NTS, as well as three alternatives for reactor immobilization that would produce waste forms suitable for disposal at Yucca Mountain. The Record of Decision determined that a combination of immobilization, using vitrification or ceramic techniques, and conversion to a mixed oxide fuel for use in existing light water reactors would be appropriate (FR 1997).

The Yucca Mountain site lies partly on the Nellis Air Force Range Complex. The U.S. Air Force is preparing the *Air Force Range Legislative Environmental Impact Statement* to assess the potential environmental impacts of renewal of the Nellis Air Force Range, which includes more than 3 million acres of land in Clark, Nye, and Lincoln counties in Nevada, all in the vicinity of Yucca Mountain (FR 1996b). The current withdrawal for the range expires on November 6, 2001. Alternatives to be evaluated in the legislative EIS include renewal of the land withdrawal indefinitely, with Congressional review every 15 years; renewal of the land withdrawal for 25 years; and the No Action alternative, which would result in no renewal of the land withdrawal. The proposed actions at the Nellis Air Force Range Complex will be considered in the Repository EIS in the analysis of cumulative impacts to the environment.

The Department of the Navy is preparing an *Environmental Impact Statement for the Proposed Master Land Withdrawal Naval Air Station Fallon, Nevada*, for the withdrawal of federally-owned lands around Naval Air Station Fallon training ranges in Churchill County, Nevada (FR 1995b). The proposed actions at Naval Air Station Fallon will be considered in the analysis of cumulative impacts to the environment in the Repository EIS.

2. THE SCOPING PROCESS

2.1 DESCRIPTION OF THE SCOPING PROCESS

On August 7, 1995, DOE published a Notice of Intent in the *Federal Register* announcing its intent to prepare an EIS for a repository at Yucca Mountain, Nevada (FR 1995a). DOE notified interested persons, including federal, state, and local government agencies, Native American tribal organizations, public interest groups, transportation interests, industry and utility organizations, regulators, and members of the general public, to participate in the scoping process. In addition, DOE held 15 public scoping meetings across the country between August 29 and October 24, 1995, to allow interested parties to present verbal and written comments. The scoping period officially closed December 5, 1995.

To encourage broad participation by the public, DOE notified stakeholders by mail prior to publication of the Notice of Intent and notified the media. Congressional representatives with jurisdiction over nuclear waste issues, Nevada's Congressional delegation, the Office of the Governor of Nevada, the affected units of local government, and affected Indian tribes were notified in advance of publication of the Notice of Intent. A series of information releases were mailed to stakeholders and members of the general public notifying them of the opportunity to comment. Press releases and public service announcements were submitted to selected newspapers, television stations, and radio stations. DOE representatives met with local television, radio, and newspaper reporters at each scoping location prior to each scoping meeting to provide information about the repository program, the EIS, and the scoping process. Information about the repository program was inserted into utility bills, and informational flyers and fact sheets were distributed widely at each scoping location and by request.

Specific techniques were employed to meet environmental justice goals for the Repository EIS. These included assessing each of the 15 cities where public scoping meetings were held to determine if any one ethnic group comprised at least 10 percent of the total population. If this was the case, then news publications and/or radio stations that specifically targeted these populations were contacted to notify them of the scoping meetings. Translators were offered upon request.

2.1.1 Pre-Scoping Briefings

Oversight and stakeholder groups were briefed prior to publication of the Notice of Intent. These groups included the Nuclear Regulatory Commission, the Nuclear Waste Technical Review Board, Native American tribal organizations, and the ten affected units of local government. The proposed action and alternatives, the proposed schedule of scoping meetings, and the means by which DOE intended to solicit public comment were discussed.

2.1.2 Public Meetings

Publication of the Notice of Intent on August 7, 1995, marked the beginning of the formal public scoping period for the EIS. Of the 15 public scoping meetings, five were conducted in Nevada. One scoping meeting with two sessions was held at each location: either a morning or afternoon session and an evening session to provide wide opportunities for public involvement.

At the beginning of each session a facilitator explained the scoping meeting format. This was followed by DOE describing the repository program, the EIS, and the scoping process. The public was encouraged to ask questions and discuss particularly important aspects of the repository program with DOE and technical staff. At the end of the question and answer period, the formal public comment portion of the scoping meeting began and the facilitator invited members of the public to comment on the scope of the EIS. Court reporters typed verbatim transcripts of the proceedings. Blank comment cards were available for those members of the public who preferred to provide written comments. A separate information room, containing exhibits and handouts about the repository program and the EIS, was set up at each public scoping meeting. Technical representatives were present to answer questions. In addition to the formal meetings, scoping comments could also be submitted to the DOE through toll-free phone calls, faxes, and conventional and electronic mail. Moreover, information about the repository program, the EIS, and the scoping process was available to the public on the Internet and in designated public reading rooms around the country.

In addition to the 15 public scoping meetings, DOE representatives also met with 13 Native American tribes to describe the EIS scoping process and encourage tribal involvement in the process. Seven hundred eighty-five (785) people attended the 15 scoping meetings, of which 242 participants provided verbal comments. Five hundred sixty-eight (568) people submitted comments during the public comment period. Table 2-1 lists the meeting locations, dates, attendance and number of commentors. Table 2-2 lists the 21 categories of issues identified during scoping and the number of people who commented.

2.2 RESULTS OF THE SCOPING PROCESS

The EIS will evaluate the site-specific environmental impacts from construction, operation, and closure of a repository for SNF and HLW disposal at Yucca Mountain, Nevada. Other wastes that require permanent isolation and are compatible for storage in a repository environment are being considered for possible evaluation in the EIS based on public scoping comments. The transportation-related impacts of the options included in the EIS will also be evaluated and a preferred regional rail corridor will be determined. The EIS will also include evaluation of:

- radiological and non-radiological releases to the environment
- occupational and public impacts

Table 2-1. Meeting Locations and Attendance

Meeting Locations	Date	Total Attendance	Number of Verbal Commentors
Pahrump, NV	August 29, 1995	42	10
Boise, ID	September 6, 1995	35	7
Reno, NV	September 8, 1995	134	40
Chicago, IL	September 12, 1995	19	8
Las Vegas, NV	September 15, 1995	221	38
Denver, CO	September 19, 1995	50	10
Sacramento, CA	September 21, 1995	32	12
Dallas, TX	September 26, 1995	18	13
Caliente, NV	September 28, 1995	27	11
Salt Lake City, UT	October 5, 1995	30	13
Baltimore, MD	October 11, 1995	40	19
Albany, NY	October 13, 1995	34	17
Atlanta, GA	October 17, 1995	30	18
Kansas City, MO	October 20, 1995	23	10
Tonopah, NV	October 24, 1995	50	16
Totals		**785**	**242**

Table 2-2. Issue Categories Identified during Scoping for the Repository EIS

Issue Category	Number of Commentors[a]
Policy	323
NEPA Process	801
Proposed Action/Alternatives	392
Schedule and Licensing of Repository	5
Land Use	156
Air	7
Geology	51
Hydrology	29
Biology	162
Health and Safety	570
Transportation	1,036
Cultural and Historic Resources	175
Environmental Justice	20
Noise and Aesthetics	4
Performance Assessment	624
Cumulative Impacts	45
Mitigation (Financial Assistance)	280
Program/Project Cost	214
Socioeconomics	66
Accidents	25
General	1,257

a. Comments received from all sources.

- accidents, including those with low probability but high consequences
- criticality
- waste isolation, a long-term performance assessment to evaluate the ability of the repository to isolate the waste
- socioeconomic impacts including the effect on employment, tax base, and public services
- environmental justice
- pollution prevention
- impacts to soil, water, and air
- biological resources and impacts to plants, animals and habitat including threatened and endangered species
- cultural resources, the impact to archaeological/historical sites and Native American resources, and
- cumulative impacts from the proposed action and other past, present, and reasonably foreseeable future actions.

The text which follows provides a summary and compilation of issues raised during the public scoping process together with the general approach for resolution. The summarized comments are provided in Appendix A, Tables A.1-1 through A.21.

2.2.1 Policy

2.2.1.1 Policy Subissue (A)

Issue Summary A total of 323 people commented on issues of a policy nature. These issues are summarized in Appendix A, Tables A.1-1 through A.1-5. Specifically, a major group of issues focused on the limited scope of the EIS; many commentors requested the EIS evaluate the need for the repository, alternatives to geologic disposal, and alternative sites to Yucca Mountain. Others requested that the EIS evaluate the disposal of more than 70,000 MTHM of spent fuel, additional types of wastes, and alternatives if the repository cannot accommodate 70,000 MTHM, including a second repository. In contrast, some people believed that DOE should maintain the limited scope, but eliminate the No Action alternative.

General EIS Approach Although the EIS will not evaluate the need for the repository, alternatives to geologic disposal, or alternative sites, the EIS may , for purposes of analysis, evaluate the disposal of more than 70,000 MTHM of SNF and HLW and may include analysis of the disposal of other wastes, as discussed in Section 1.3. These analyses are being considered as a result of public comments provided during the scoping process. The EIS will include a No Action alternative. In response to public comment, DOE is considering evaluating expanded inventory "modules" in the EIS to analyze the disposal of all projected SNF and HLW, as well as other highly radioactive waste types that may require permanent isolation.

2.2.1.2 Policy Subissue (B)

Issue Summary Other commentors requested that the Repository EIS be deferred pending resolution of major programmatic issues including proposed new legislation, environmental release standards, and funding issues. Others questioned the short schedule for completing the EIS, with the stated concern that the results of ecosystem-based studies on the long-term consequences of the repository to future generations may not be available during preparation of the EIS. Others requested that the implementation plan describe where the results of these studies would be made public (for example, in supplemental EISs).

General EIS Approach DOE does not believe that Repository EIS should be deferred. The site recommendation must be accompanied by an EIS, and the Repository EIS will fulfill that mandate. The schedule for completing the Repository EIS by 2000 is based on the complexity and uniqueness of the program and the parallel timing of site characterization activities and license application development. The EIS will reference or summarize the results of available studies that are relevant to the long-term effects of the repository on future generations, and these references or appendices will be available for public review. Where studies have not been completed, the EIS will make assumptions that are founded in scientific evidence for purposes of analyses.

2.2.1.3 Policy Subissue (C)

Issue Summary Some commentors were concerned that Yucca Mountain was selected as the only possible site for a repository. Some cited Nevada's political weakness, and asserted that Congress and not science narrowed three possible sites to only one. Some wanted to know how the DOE planned to acquire control of the site considering that the consent of the Nevada Legislature is required. Others said that each shipment of waste entering Nevada should be taxed.

General EIS Approach In 1987, Congress directed the DOE to "provide for an orderly phase-out of site specific activities at all candidate sites other than the Yucca Mountain site" (NWPA). If Yucca Mountain is recommended by the Secretary of Energy and then by the President for development as a repository, the Governor and the legislature of the State of Nevada could notify Congress if they disapprove the site. This action would end the repository program in Nevada unless Congress enacts legislation to approve the site over the objections of the State of Nevada.

The Nuclear Regulatory Commission regulations require DOE to demonstrate that the land on which the geologic repository operations area and the controlled area would be located be either acquired and under DOE's control or be permanently withdrawn and reserved for DOE's use. Under Nuclear Regulatory Commission regulations, these lands would need to be free and clear of all encumbrances, such as those arising under general mining laws, easements for rights-of-way, leases, deeds, patents, and mortgages. These regulations and institutional controls will be discussed in the EIS. There are no provisions in the NWPA for Nevada, or counties in Nevada, to tax waste shipments entering the State.

2.2.1.4 Policy Subissue(D)

Issue Summary Commentors questioned if and under what conditions the DOE would recommend that Yucca Mountain is unsuitable for a repository. Some commentors questioned what DOE's plan would be if the site were found to be unsuitable. Others believed that the site would never be found unsuitable because of the large amount of money already spent, and they stated that the siting guidelines are revised when technical problems arise.

Some commentors wanted to know how the DOE planned to increase public confidence in the program's scientific basis and in DOE's management of the program. A few said the waste should be retrievable far beyond the 100 years planned by DOE, because the waste may become valuable in the future and because future technological advances may be able to neutralize the waste. Others were concerned that the accumulation of waste in one place, and waste transport, could offer opportunities for terrorism and weapons proliferation.

General EIS Approach DOE's site characterization and related work at Yucca Mountain has been, and continues to be, subjected to the scrutiny of Congress, the National Academy of Sciences, the Nuclear Waste Technical Review Board, the Environmental Protection Agency, the Nuclear Regulatory Commission, the State of Nevada, affected counties, and Native American Indian tribes. This scrutiny has helped to ensure the technical adequacy and credibility of DOE's evaluation, and to enhance public confidence in the scientific basis and management of the program. The EIS will evaluate waste retrievability for up to 100 years from start of emplacement (prior to repository closure) consistent with Nuclear Regulatory Commission regulations. The long-term performance assessment evaluates environmental impacts out to 10,000 years or to the time of peak dose if peak dose occurs at a later time. The potential for terrorism and weapons proliferation will be discussed in the EIS. The EIS will either discuss or reference: the Safety Analysis Report, as appropriate; the safeguard and security measures to be employed during waste transport and disposal; and for closure, prevention of the unauthorized removal of waste from the repository.

The NWPA directs DOE to evaluate the suitability of the Yucca Mountain site as a potential site for a geologic repository. If the Secretary of Energy determines that the site is suitable, the Secretary may then recommend that the President approve the site for development of a repository. Under the NWPA, any such recommendation shall be considered a major Federal action and must be accompanied by a final EIS. Accordingly, DOE is preparing the Repository EIS in conjunction with any potential DOE recommendation regarding the development of a repository at Yucca Mountain. The Repository EIS will analyze the potential environmental impacts of the construction, operation, and eventual closure of a repository at Yucca Mountain.

2.2.1.5 Policy Subissue (E)

Issue Summary Some commentors said the EIS should address construction of the exploratory tunnel and related facilities as a *de facto* repository. Commentors also said that baseline conditions should be those that existed prior to the start of site characterization. Another issue

was the safety of the repository considering that existing and proposed radiation-release standards allow for some radiation to escape from the repository.

General EIS Approach The NWPA authorized DOE to engage in appropriate site characterization activities to learn as much as possible about the site. The exploratory tunnel and related facilities are part of this site characterization program. The proposed action is to construct, operate, and close a repository. The purpose of the EIS is to assess the environmental consequences of this action on the affected environment. Thus for purposes of the EIS, the affected environment or "baseline conditions" will be those that exist, or are anticipated to exist, at the time the Draft EIS is issued for public comment.

The DOE is required to demonstrate compliance with the Environmental Protection Agency standards (yet to be finalized) for the Yucca Mountain project in its licensing application to the Nuclear Regulatory Commission. The EIS will analyze the long-term environmental impact, if any, from waste disposal.

2.2.1.6 Policy Subissue (F)

Issue Summary Other policy comments were related to transportation, uncertainty in predicting long-term performance, the relationship of the Repository EIS to other DOE or other agency EISs currently in preparation, and the liability and responsibility of potential accidents at the repository. Specifically, these commentors were concerned about: (1) how the transportation analysis would be done and what the scope of this analysis would be (e.g., would it be conducted on a mile-by-mile basis and include emergency-response measures); (2) how to predict future events and have confidence in assumptions that are made; (3) the relationship between the Repository EIS, the U. S. Navy Multi-Purpose Container System EIS, and the NTS EIS; and (4) what agencies are liable in the event of an accident involving nuclear waste.

General EIS Approach Section 2.2.11 of this document discusses the scope of the transportation analysis which will analyze representative transportation corridors; however, the impacts will not be discussed on a mile-by-mile basis. Emergency response and safeguards and security during transportation will also be discussed. The long-term performance assessment that will be conducted for the Repository EIS is discussed in Section 2.2.15 of this document. As noted previously, the performance assessment will identify events and processes that bound the potential environmental impacts from emplacing SNF and HLW. The relationship between the Repository EIS and other DOE and non-DOE EISs, including the two mentioned above, is discussed in Section 1.4 of this document. As noted in Section 2.2.19 of this document, the Repository EIS will discuss organizations having financial responsibilities for emergency response and preparedness as well as responsibilities to remediate accidents from either transportation or repository operations.

2.2.2 NEPA Process

Issue Summary Eight hundred and one (801) people commented on issues related to NEPA requirements and procedures. These issues are summarized in Appendix A, Table A.2.

Specifically, the comments related to maximizing participation in the public scoping process, preparing the Implementation Plan, conducting consultations as required by the NEPA process, the content of the Record of Decision, and performing the impact analysis. Some commentors wanted meetings and hearings to be held in their particular communities, especially if SNF or HLW would be transported through their community. Other commentors stated that insufficient notice and inadequate information were provided relative to the public scoping meetings. Others requested that either the meeting format or the scoping process be modified to encourage broader public participation, provided suggestions for the content of the Implementation Plan and the Record of Decision, and made suggestions and recommendations regarding consultations to be conducted as part of the NEPA process. Other commentors made general recommendations about conducting the impact analysis for the EIS.

General EIS Approach Section 2.1 of this document describes the scoping process for the EIS and the DOE efforts to provide opportunities for public involvement in the process. The location of meetings and hearings during the public comment period for the Draft EIS has not been selected. As discussed in Section 1.1, although an Implementation Plan will not be prepared for the Repository EIS, this comment summary document was prepared to summarize the issues identified during the scoping period for the EIS and to discuss the general approach for how these issues will be addressed in the EIS. Analyses that are planned for specific issues identified during scoping are discussed in this section.

2.2.3 Proposed Action and Alternatives

Issue Summary Three hundred and ninety-two (392) people commented on issues related to the proposed action and alternatives to be evaluated in the EIS. These issues are summarized in Appendix A, Table A.3. Specifically, the comments related to expanding the scope of the EIS to include analysis of: disposal of all projected SNF and HLW, as well as other highly radioactive wastes; evaluation of alternatives to geologic disposal; additional options for transportation routing and modes and packaging; alternatives for implementing each phase of the repository (construction, operation, and closure); and additional thermal management strategies. Issues related to the evaluation of the No Action alternative included comments that the evaluation should include impacts at waste generator sites in the event that a repository at the Yucca Mountain site would not be constructed. Other issues focused on the EIS providing a thorough and equivalent level of discussion for all alternatives and all wastes and waste characteristics.

General EIS Approach The EIS will evaluate a proposed action to construct, operate, and eventually close a repository at Yucca Mountain for the geologic disposal of 63,000 MTHM of commercial SNF and 7,000 MTHM of DOE SNF and HLW. Four alternatives will be evaluated; three implementing alternatives for the proposed action and a No Action alternative. The implementing alternatives will be based on thermal load objectives; namely, a high thermal load that considers the emplacement of greater than 80 MTHM per acre, an intermediate thermal load of between 40 and 80 MTHM per acre, and a low thermal load of less than 40 MTHM per acre. Based on the comments received, DOE is considering presenting incremental analyses of the disposal of all projected SNF and HLW, as well as other highly radioactive waste types that may

require permanent isolation.

As part of each implementing alternative, two packaging options will be evaluated. Under Option 1, SNF assemblies would be packaged and sealed in multi-purpose canisters at the generator sites prior to being transported in casks to the repository. HLW would be packaged and sealed in canisters prior to shipment in similar casks. Under Option 2, SNF assemblies (without canisters) and sealed canisters of HLW would be transported to the repository.

Each implementing alternative will also evaluate five transportation options, two national and three regional (i.e., within the state of Nevada). For the national transportation, the first option would consist of shipping all SNF and HLW by truck, from the generator site to the repository. The second national option would consist of shipment by rail, except from those generator sites that do not have existing capabilities to load and ship rail casks. For the regional transportation, there are three options; two apply to shipments that would arrive in Nevada by rail, and the third applies to shipments that would arrive by truck. The first regional transportation option would evaluate several rail corridors to the repository, leading to the selection of one preferred rail corridor. The second regional transportation option would involve the use of heavy haul truck routes to the repository, including the construction and operation of an intermodal transfer facility to receive shipments that would arrive by rail. The third regional transportation option would involve legal weight truck shipments from the generator sites directly to the repository.

Under the No Action alternative, a geologic repository at the Yucca Mountain site would not be operated. SNF and HLW would continue to accumulate at the 75 commercial nuclear reactor sites and at DOE facilities. Any existing equipment and facilities at the Yucca Mountain site (for example, the exploratory studies facility and support facilities) could be reclaimed, dismantled and removed for reuse, recycling, or disposal as appropriate.

The No Action alternative will be analyzed by evaluating a generic commercial nuclear reactor site and continued storage at DOE facilities using the following assumptions. Storage containers at commercial sites would be routinely monitored for corrosion and repackaged as necessary to comply with safety requirements. The DOE-owned SNF would continue to be stored at the Hanford Site, the Idaho National Engineering Laboratory, and the Savannah River Site. The commercial site and DOE facilities would continue to be operated for a period of 100 years to ensure public health and safety, after 100 years institutional control is assumed to be lost.

2.2.4 Schedule and Licensing of Repository

Issue Summary Five commentors asked about the schedule for, and licensing of, the repository. These comments are summarized in Appendix A, Table A.4. The comments focused on DOE's responsibility to begin accepting waste shipments in 1998, the schedule for submitting a license application to the Nuclear Regulatory Commission, and whether this schedule is the driver for DOE starting scoping hearings in 1995. Another comment related to why so many years are required between scoping and licensing.

General EIS Approach The legislative history of the repository program and DOE's efforts to meet Congressionally-mandated and other requirements of the program will be discussed in the background section of the EIS. This section will also discuss legislative mandates that have evolved over the past 14 years, as well as regulatory drivers that apply to the repository program. In 1996, the U.S. Court of Appeals for the District of Columbia [*Indiana Michigan Power Company, et al. vs. Department of Energy and United States of America, et al.*, 88 F.3d 1272 (D.C. Cir. 1996)] ruled, in response to a petition filed by various utilities, public utility commissions, and states attorneys general, that DOE is obligated to start disposing of SNF from standard contract holders no later than January 31, 1998, under the terms of the NWPA. However, the Court also found that since that date has not yet arrived, it is premature to determine an appropriate remedy because no violation of the NWPA or Standard Contract terms has yet occurred. The NEPA process for the Repository EIS (i.e., from publication of the Notice of Intent to preparation of a Record of Decision) is scheduled to take about five years to ensure that appropriate data gathering and tests are performed to adequately assess potential environmental impacts, and to allow the public sufficient time to consider this complex Program and provide input. The preparation of a license application will parallel the preparation of the Repository EIS and rely on much of the same technical information. The license application is currently scheduled to be submitted to the Nuclear Regulatory Commission in 2002. Based on comments received regarding DOE's responsibility to begin accepting waste by 1998, DOE is considering incremental analysis for receipt of waste at Yucca Mountain prior to full operation of the repository.

2.2.5 Land Use

Issue Summary One hundred and fifty-six (156) people commented on land use. These comments are summarized in Appendix A, Table A.5. The issues focused on the effects of constructing and operating the repository and related facilities (such as a rail line, heavy-haul roads, and transfer stations) and on the use and management of land. Commentors were concerned about consistency with existing land use plans, about the use of rights-of-way and eminent domain for repository components, and about potential impacts on recreational uses and grazing. Other issues dealt with coordinating regional councils, cleanup standards, public access across transportation corridors in Nevada, and potential conflicts with U.S. Air Force operations on the adjacent Nellis Air Force Range Complex. Ecosystem management at Yucca Mountain and consistency with the DOE's Land Facility Use Management Policy and the Resource Management Plan for the NTS, were also concerns.

General EIS Approach Land ownership and major land use in the region of influence for Yucca Mountain will be discussed in the EIS. The land ownership and land use along regional transportation routes and other Nevada-based repository facilities will also be discussed. Impacts to land resources in the region of influence from construction and operation of the repository will be examined in the EIS. This will include analysis of land withdrawal and potential impacts on the NTS and at the Nellis Air Force Range Complex, to public and private lands, and to State and other Federal lands. Land-use impacts from potential land acquisition and construction and operation of new rail-lines, heavy-haul roads, and transfer facilities in Nevada will also be

evaluated. The total acreage to be disturbed for each major component of the repository (surface and subsurface facilities, rail line, new roads, etc.) and during each phase of the program (construction, operation, and closure) will be discussed. The impacts of co-located Yucca Mountain and NTS operations will be evaluated in the analysis of cumulative effects.

2.2.6 Air Quality and Meteorology

Issue Summary Seven people commented on air quality and meteorology. These comments are summarized in Appendix A, Table A.6. Comments focused on how constructing and operating the repository and related facilities (rail line, heavy-haul roads, and waste-transfer facilities) could degrade air-quality, affect health from exposure to airborne radiation, and impair visibility which could reduce the safety of waste transport.

General EIS Approach Existing air quality in potentially affected air basins in Nevada will be characterized in the EIS. Class-I air-quality areas within the Yucca Mountain region of influence and other potentially affected areas, if any, in Nevada will be identified. Meteorological conditions such as severity and type of storms, temperature extremes, and precipitation will be described.

Potential impacts to air quality from routine air emissions to the atmosphere during each phase of the repository program will be estimated for potentially affected air basins in Nevada. The air emissions from the repository and related facilities in Nevada will be compared to State and Federal ambient air-quality standards and health effects will be estimated. Cumulative impacts to air quality will consider existing and anticipated future actions at Yucca Mountain, the Nellis Air Force Range Complex, the NTS, and other sources of air pollutants, such as nearby mining operations and nearby cities.

2.2.7 Geology

Issue Summary Fifty-one (51) people commented on geology. These comments are summarized in Appendix A, Table A.7. Comments focused on predicting earthquakes and the effects from earthquakes, and predicting the effect of volcanism on repository operations and long-term transport of radionuclides. The validity of geologic mapping including identifying faults and joints and the effect on the rock of underground weapons-testing at the NTS were also issues. The transport of radioactive and hazardous materials that could spill and potentially migrate into the subsurface rock at Yucca Mountain were also concerns. Other comments related to identifying paleontologic sites that could potentially be impacted by the proposed actions, to assessing the mineral-resource potential of areas withdrawn for the repository, and to indicating whether DOE would monitor and numerically model surface subsidence caused by underground excavations.

General EIS Approach The geologic conditions that could affect long-term containment of disposed radioactive material will be described in the EIS including seismicity, geologic structure, and the volcanism of the region. The results of seismic hazard analyses and the

seismic design of the facility will also be discussed. Any paleontologic sites that could be affected by construction and operation of the repository will be described and the mineral-resource potential of areas that may be withdrawn will be assessed. The groundwater quality will be discussed and data will be reviewed to determine if there are effects from past weapons-testing on the NTS or from spills and from the intentional injection of tracers during characterization of the Yucca Mountain site. Data collected to support site characterization activities (i.e., information on rock properties) will be analyzed to assess the likelihood and potential consequences of subsidence. Attributes related to geology, such as topography, soil erodability, landslide potential, and faults and subsidence zones are being included in the criteria to be used for the selection and evaluation of rail alignment and heavy haul routes. The geologic setting along rail and truck routes in Nevada and throughout the nation will not be described in detail.

The effect of uncertain long-term geologic events will also be discussed in the EIS. The potential effects on the rock at Yucca Mountain from past testing of nuclear weapons at the NTS will be discussed in the EIS using the best available data. The economic impacts, if any, of precluding development of mineral resources in areas that may be withdrawn will be discussed in the EIS as described in Section 2.2.5. The EIS will address compliance with all regulatory requirements.

2.2.8 Hydrology

Issue Summary Twenty-nine (29) people commented on hydrology. These comments are summarized in Appendix A, Table A.8. The comments focused on the regional impacts of the repository and for waste transport relative to the quality and quantity of surface water and groundwater; how the effects on surface water and groundwater would be analyzed; and that additional characterization of the deep aquifer system was required to determine the potential effect on groundwater quality in areas such as Amargosa Valley, Ash Meadows, and Death Valley National Park. Some commentors were concerned with the nature and extent of contamination, groundwater monitoring, the possibility of long-term changes in the elevation of the groundwater table, flooding, and the potential for a nuclear criticality. Other commentors were concerned about DOE being in compliance with Nevada water-rights regulations.

General EIS Approach The hydrologic characteristics of the Alkali Flat-Furnace Creek Ranch groundwater basin, where Yucca Mountain is located, will be described in the EIS. The mechanics of flow and water quality in the saturated and unsaturated zones at Yucca Mountain and in areas such as Amargosa Valley, Ash Meadows, and Death Valley National Park will also be described.

Groundwater monitoring has been ongoing for the last eight years and will continue to be conducted at the site. The EIS will discuss the need for and the extent of a pre-closure groundwater-monitoring network. The need for a post-closure monitoring network would be based in part on the results of pre-closure monitoring. As a result, the need for and details of a post-closure groundwater-monitoring network will not be included in the EIS.

The EIS will describe the possible environmental impacts from water in the repository environment. Potential mechanisms include percolation of surface water downward through the unsaturated zone along fractures and through the rock matrix, and from a potential rise in the elevation of the water table from regional and global climate changes over thousands of years. (The underground repository would be constructed in unsaturated rock about 700 feet above the water table.) The EIS qualitatively describe (1) the effects of reasonably feasible future climatic extremes on the flow of groundwater and the elevation of the water table in the vicinity of Yucca Mountain, (2) the likely cause and meaning of the elevated concentrations of tritium found in the unsaturated zone at Yucca Mountain, and (3) the likelihood of deep-seated hot water invading the repository.

The EIS will also qualitatively describe the potential impacts on water quality and water flow at springs and wells in the Alkali Flat-Furnace Creek Ranch groundwater basin.

2.2.9 Biology

Issue Summary One hundred sixty-two (162) people commented on issues related to biology. These comments are summarized in Appendix A, Table A.9. The concerns focused on impacts to critical habitat for threatened, endangered, and sensitive species and other biologic resources from implementing the repository program. Specific issues included concerns about potential changes in the surface ecosystem at Yucca Mountain from waste-generated heat and impacts to wildlife and their habitat from both repository construction and operation and from transporting waste. Other commentors were concerned about the effects on wilderness and public recreation areas from construction and operation of national and regional waste-transportation corridors and the potential loss of revenue from the loss in big-game habitat.

General EIS Approach The EIS will describe biological resources within affected areas in Nevada including threatened, endangered, and sensitive species (i.e., species of concern to the State of Nevada) and game species. Potentially affected areas include Yucca Mountain and portions of the Alkali Flat-Furnace Creek Ranch groundwater basin, potential waste-transfer sites in Nevada, and waste-transport corridors in Nevada.

The EIS will evaluate impacts to wildlife and wilderness and public recreation areas at and near Yucca Mountain from construction and operation of the repository based on currently available information. Post-closure effects to wildlife from a potential increase in heat at the surface by implementing the various alternatives will also be evaluated. Attributes related to biology, such as terrestrial habitats, floodplain and wetland communities, protected areas, federal and state threatened and endangered species, and other special status species will be included in the criteria to be used for the selection of rail alignments and heavy haul routes. Potential for loss of game habitat will be assessed.

2.2.10 Health And Safety

Issue Summary Five hundred seventy (570) people commented on issues related to health and safety. These comments are summarized in Appendix A, Table A.10. Specific concerns included requests for baseline health assessments of potentially affected areas, concerns about past radiation exposure, radiological impacts during operations and after closure, exposure pathways and scenarios that would be evaluated, and the effects of radiation on Native Americans and agriculture from human error and nuclear arms proliferation.

General EIS Approach The Repository EIS will characterize the baseline affected environment using the best available data. Past radiation exposures from activities at the NTS (e.g., from atmospheric testing) will be considered in the cumulative impacts section of the EIS using existing published studies. The radiological impacts to workers and the public including Native Americans will be analyzed in the EIS, for both the pre-closure time period, which includes transportation, and the post-closure time period. Potential worker doses will be evaluated assuming both normal operations and accident conditions. Radiological impacts to the public during all phases of repository activity (construction, operation, closure, and post-closure) will be assessed.

2.2.11 Transportation

2.2.11.1 Transportation Subissue (A)

Issue Summary One thousand thirty-six (1,036) people commented on issues related to transportation. These comments are summarized in Appendix A, Tables A.11-1 through A.11-7. Issues raised by commentors included transportation routing, transportation accidents, human health impacts related to transportation, transportation emergency response, transportation shipping containers, pre-notification, liability after transportation accidents, sabotage or terrorist attacks, and the economic impacts of transportation accidents.

General EIS Approach The Repository EIS will analyze the radiological and nonradiological impacts of shipping radioactive material to the repository. The impact analyses will include the impacts from both normal operations and accidents. The impacts from transporting radioactive material will include the risks to populations surrounding and sharing the transportation routes, to transportation workers, and to populations and the maximally exposed individual as a result of transportation accidents. The transportation accident analyses will include the risks from low probability/high consequence accidents and the risks from high probability/low consequence accidents. The EIS will include a detailed discussion of the transportation risk assessment methods and models, and the data used in the transportation analyses will also be presented. For example, shipment numbers and shipping container capacities and inventories will be presented.

Transportation issues such as pre-notification, emergency response, liability, transportation regulations (e.g., U.S. Department of Transportation and Nuclear Regulatory Commission regulations) and orders (e.g., DOE Orders), and safeguards and security issues will be discussed in the EIS. Sabotage or terrorist attacks will also be discussed.

The Repository EIS transportation analyses will include both truck and rail transport. The highway transportation analyses will be based on Department of Transportation routing regulations for the transport of radioactive materials. These regulations will be discussed in the EIS. The transportation analyses will use representative transportation routes and actual route characteristics, such as distances, population statistics, and state-level accident rates.

2.2.11.2 Transportation Subissue (B)

Issue Summary Commentors also offered criteria for the evaluation and selection of the rail alignments and heavy haul routes within Nevada. These criteria included attributes such as cost, land use, engineering feasibility, environmental impacts, transportation safety and risk, potential for shared use, availability of data, conflicts with U.S. Air Force operations, and cultural resources.

General EIS Approach Many of the criteria offered by commentors have been incorporated into the selection and evaluation criteria. For example, criteria related to environmental impacts, such as the impacts to water resources, land forms and geology, air quality and biological resources have been incorporated. The detailed criteria used to evaluate and select the rail alignments and heavy haul routes will be presented in the EIS.

2.2.12 Cultural And Historic Resources

Issue Summary One hundred seventy-five (175) people commented on issues related to cultural resources and Native American concerns. These comments are summarized in Appendix A, Tables A.12-1 and A.12-2. Commentors requested that the EIS include the results of detailed cultural-resource surveys at Yucca Mountain and along transportation routes and that the EIS evaluate historical and prehistorical sites, as well as paleontological resources. Other commentors were concerned about the effect of the Repository program on Native American cultures. People also requested that the Repository EIS fulfill commitments made in the 1986 Environmental Assessment of Yucca Mountain; that the Repository EIS be used as a forum for government-to-government relations; and that the Repository EIS acknowledge the differences between Western civilization and Native Americans with regard to nature. Among the specific comments received included the request to describe Native American land claims in Nevada, treaty obligations, federal laws relating to cultural and religious rights of Native Americans, unsettled political and legal issues, and the application of Indian law to the repository.

General EIS Approach Prior to any planned construction at Yucca Mountain, or within transportation corridors, the DOE would conduct surveys for cultural and historic resources and report the findings to the Nevada State Historic Preservation Officer and the Advisory Council on Historic Preservation. The results of available surveys, as well as studies of resources, will be discussed in the EIS.

The Yucca Mountain Project has maintained a Native American Interaction Program since the late 1980s. This interaction program involves Official Tribal Contact Representatives appointed from 17 tribes and organizations from Nevada, California, Arizona, and Utah. These

Western Shoshone, Southern Paiute, and Owens Valley Paiute and Shoshone people have provided important cultural resource protection information to the project. These interactions will be documented in the EIS.

The DOE recognizes that Native American land claims in Nevada have been an issue of much concern among Native American groups, especially the Western Shoshone. The DOE, however, must abide by recent rulings by the U.S. Supreme Court concerning control of land in much of southeastern Nevada, including the Yucca Mountain area. Applicable land claims issues, treaties, and Federal requirements concerning Native Americans and cultural and religious rights will be discussed in the EIS.

2.2.13 Environmental Justice

Issue Summary Twenty people (20) commented on environmental justice issues. These comments are summarized in Appendix A, Table A.13. Several commentors noted that the EIS must perform an environmental justice analysis consistent with federal directives and comply with federal statutes regarding environmental justice. Commentors stated the analysis should include consideration of disproportionate effects on certain communities, including poor, rural, people of color, any other subgroup of the U.S. population, and any Native American group. Commentors also indicated the EIS also should acknowledge that the Yucca Mountain site and NTS is Western Shoshone land, in consideration of the reserved right of the Western Shoshone Indian Nation.

Most of the 20 commentors indicated that the EIS should fully assess equity concerns by evaluating potential disproportionate impacts on each affected economic, ethnic or racial group along transportation routes. They requested that the assessment should consider emergency response and preparedness capabilities, and the need for training and education of each affected group.

In addition, commentors requested that the EIS consider previous disproportionate impacts citing past and current radioactive and hazardous waste activities at the NTS, and DOE's preferential financial assistance to the affected units of local government, but not certain Indian tribes. The latter was noted by commentors to be in conflict with DOE's Indian policy.

General EIS Approach The EIS will include an evaluation of environmental justice issues as they pertain to the DOE's proposed action of constructing, operating, and closing a repository at Yucca Mountain. Although DOE has not yet developed its detailed analytical approach for environmental justice, the evaluation will be consistent with both the Council on Environmental Quality and DOE guidance for implementing the Environmental Justice Executive Order 12898.

As part of developing the approach for the Repository EIS, in addition to consideration of scoping comments, DOE will also closely review many of the recently completed EISs which address management of SNF, weapons materials and highly radioactive wastes (including the Programmatic Spent Nuclear Fuel Management EIS, the EIS on a Proposed Nuclear Weapons

Nonproliferation Policy Concerning Foreign Research Spent Nuclear Fuel, the Programmatic Waste Management EIS, the Storage and Disposition of Weapons-Usable Fissile Materials Programmatic EIS, the Stockpile Stewardship and Management Programmatic EIS, the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components EIS, and the Department of the Navy's final EIS for a Container System for the Management of Naval Spent Nuclear Fuel). Based on this review, and where it makes sense to do so, DOE may use and adapt the approaches and methodologies used for environmental justice analyses by these other EISs. This is consistent with the Council on Environmental Quality regulations which encourage agencies to reduce excessive paperwork in preparation of EISs by incorporating by reference and eliminating repetitive discussions.

DOE acknowledges that there is significant disagreement among the Native American Indian community concerning the Ruby Valley Treaty of 1863 and the lands addressed under that Treaty. DOE must abide by the U.S. Supreme Court rulings. It is not the role or function of the EIS to address or attempt to resolve disputes over such Treaty rights.

Rather, the EIS will evaluate, in accordance with established NEPA precedents, the potential environmental impacts that may be associated with the construction, operation, and eventual closure of a repository at Yucca Mountain. This evaluation of the proposed action will include the potential impacts from transporting spent fuel and HLW along both national and regional transportation routes. The environmental justice evaluation that is developed for the EIS will include consideration of transportation-related effects (also see Section 2.2.11 for additional information regarding transportation analyses). As already mentioned above, DOE will be reviewing many other recently completed EISs for their approaches, methodologies, and scope of analyses. Several of these EISs consider in some detail the potential impacts associated with transportation of spent fuel, weapons materials, and highly radioactive wastes, and also discuss the environmental justice issues that may be raised by potentially extended shipping campaigns involving these materials. DOE also plans to coordinate with the U.S. Department of Transportation to obtain any guidance it may have developed for purposes of implementing the Environmental Justice Executive Order 12898.

2.2.14 Noise And Aesthetics

Issue Summary Four people commented on noise and aesthetics. These comments are summarized in Appendix A, Table A.14. Commentors stated that the EIS should assess baseline and project-induced noise levels along waste-transport routes in Lincoln County and at other County sites where repository facilities and activities would be located (intermodal transfer sites, borrow sites, highway-construction sites, and heavy-haul routes) and that impacts to the quality of life and to wildlife should be evaluated.

General EIS Approach The existing baseline noise environment and visual setting at Yucca Mountain and along transportation routes in Nevada will be characterized in the EIS. The impact on the environment from noise generated at the repository, at the intermodal-transfer facilities, and during construction of transportation routes in Nevada will be assessed. The visual impact of

the repository and of other waste-handling facilities in Nevada, and of operating a rail line in Nevada will also be assessed in the EIS. The analysis for potential impacts to wildlife was described in Section 2.2.9.

2.2.15 Performance Assessment

Issue Summary Six hundred twenty-four (624) commentors were concerned about the performance assessment to be conducted for the geologic repository. These comments are summarized in Appendix A, Table A.15. Eight specific issues were identified that related to: the type of events and processes that should be evaluated in the Repository EIS, the identification of engineered barriers and the ability of waste packages to maintain integrity over thousands of years, the methods used to conduct the performance assessment and evaluate uncertainty, the prediction of human intrusion, the identification of performance measures and institutional controls, the analytical time frame for the performance assessment, and the prediction of potential future impacts.

General EIS Approach. The Repository EIS performance assessment will assess events and processes that bound the potential environmental impacts from emplacing SNF and HLW, including those events and processes having low-probabilities of occurrence, but resulting in high consequences. Total system performance assessments prepared by DOE since 1993 evaluate the ability of the overall system to meet the performance objectives/measures identified in the applicable regulatory standards. These assessments explicitly acknowledge the uncertainty in the process models and parameters and evaluate the impact of this uncertainty on the overall performance.

The proposed engineered features to contain the waste packages will be described in sufficient detail to support the long-term performance assessment. The performance assessment will evaluate degradation of the waste packages given different thermal loads and consider infiltration rates, corrosion models, and other relevant factors. This analysis will consider both manmade and natural materials to retard the movement of radionuclides from the waste packages. Assumptions made for purposes of analysis will be documented in the EIS.

Intruder scenarios to be evaluated in the Repository EIS will be consistent with those required for potential licensing by the Nuclear Regulatory Commission. Non-fatal and fatal latent cancers will be reported in the Repository EIS. The analytical time frame for the Repository EIS will focus on a period of 10,000 years. Analysis will be extended to the time of peak dose and the results used qualitatively. Institutional controls to be implemented will also be described.

2.2.16 Cumulative Impacts

Issue Summary Forty-five (45) people commented on the scope of the analysis for cumulative impacts. These comments are summarized in Appendix A, Table A.16. Specific concerns were that the analysis consider the cumulative radiological risks and hazards from all past, current and

proposed activities involving radiological material not only at Yucca Mountain but at the NTS and other areas where radioactive material has been managed. Commentors were also concerned about the cumulative radiological effects on the human and natural environment from all past, present, and proposed activities involving radioactive material. Other commentors requested that the cumulative impacts section of the EIS address an inventory greater than the 70,000 MTHM limit imposed by the NWPA.

General EIS Approach DOE is considering options to evaluate the disposal of all commercial SNF and HLW, all DOE-owned SNF and HLW, and other wastes that are compatible with a repository environment. The cumulative impact analysis in the Repository EIS will also evaluate the impacts to the environment from past, present, and reasonably foreseeable activities at the NTS, the Beatty low-level waste disposal site, the Nellis Air Force Range, and from the potential shipment of other radioactive materials to the repository as described in Section 1.4. This analysis will include the cumulative impacts to both humans and the natural environment from transporting radioactive material from commercial and DOE sites as discussed in Section 1.4.

2.2.17 Mitigation

Issue Summary. Two hundred eighty (280) people commented on mitigation measures. These comments are included in Appendix A, Table A.17. The primary concern was that the EIS and the resulting Record of Decision and Mitigation Action Plan include and evaluate specific measures to mitigate all impacts, both from routine operations and potential accidents. In addition, commentors indicated that financial compensation should be provided to communities and individuals that could be affected by any phase of repository operations. One commentor indicated that the EIS should more fully consider the options for implementing assistance as required by Section 180(c) of the NWPA.

General EIS Approach The EIS and Record of Decision will discuss measures to mitigate adverse impacts, as necessary. General types of mitigation to be considered include: (1) impact avoidance by, for example, not undertaking certain activities, (2) impact minimization by limiting the degree or extent of certain activities, (3) impact rectification by repairing, rehabilitating, or restoring the affected environment (e.g, surface reclamation), (4) impact reduction or elimination over time, and (5) impact compensation by replacing or providing substitute resources.

Mitigation measures that are included in the Record of Decision will form the basis of DOE's Mitigation Action Plan. Pursuant to DOE regulations, the Mitigation Action Plan will explain how the mitigation measures will be planned and implemented. Following implementation, periodic status reports that address each mitigative measure will be prepared. The Mitigation Action Plan, like the EIS and Record of Decision, will be publicly available.

Section 180(c) of the NWPA requires DOE to provide technical assistance and funds to those States and Indian Tribes in which SNF and HLW will be transported. The assistance and funds are to cover procedures for safe routine transportation, as well as procedures for dealing

with emergency response situations. The EIS will discuss these requirements as well as the status of any relevant planning. However, options for implementing Section 180(c) will not be evaluated in the EIS.

2.2.18 Program/Project Cost

Issue Summary Two hundred fourteen (214) people commented on the cost of the proposed project. These comments are summarized in Appendix A, Table A.18. Specific concerns were related to conducting a total life-cycle cost estimate for each alternative for each phase of repository development (i.e., construction, operation, closure) including transportation. Other comments were concerned about who has financial responsibility for operating the repository and who would have financial responsibility in the event of an accident. Commentors were also concerned about the funding source for the program and requested that the EIS consider funding constraints in the analysis of costs including the analysis of a funding shortfall.

General EIS Approach DOE will consider estimates of the total system life-cycle costs for construction, operation, and closure of the repository as a relevant factor in making a final decision on the proposed action. However, costs will not be addressed in the EIS. The EIS will discuss both Nuclear Waste Fund and DOE funding as they pertain to financial responsibility for development, operation, and closure of the repository. The EIS will also describe organizations having financial responsibilities for emergency response and preparedness as well as responsibilities to remediate accidents from repository operations or transportation.

2.2.19 Socioeconomics

Issue Summary Sixty-six (66) people commented on issues related to socioeconomics. These comments are summarized in Appendix A, Table A.19. The issues focused on what populations should be evaluated and what attributes should be analyzed; the definition of the baseline affected environment; what data should be used as input into the socioeconomic analysis, the appropriate level of analysis and the methodology that would be used to conduct the analysis. Other commentors requested that the EIS discuss mitigation of socioeconomic impacts and that uncertainties, including data and future funding problems that might affect socioeconomic impacts, be described and the impact of these uncertainties be explained.

General EIS Approach The socioeconomic sections of the document will assess the impacts on local and regional socieconomic conditions considering attributes such as population, employment, economy, housing, and public finance. The EIS will use a baseline consistent with when the Draft EIS is released. Baseline information at the state, county and, where appropriate, local levels will be described including economic fiscal conditions and structure; population distribution; community services; social structure; and culture and lifestyle. Baseline data will be gathered from many sources that could include the State of Nevada, counties and cities in Nevada, and Native American groups.

The EIS will evaluate the socioeconomic impact in Nevada from implementing the repository program for each program phase. Potential socioeconomic impacts will be evaluated in a region of influence defined to assess localized effects around the site in addition to conducting a regional analysis to determine the effects on the economy. The EIS will identify key assumptions of the socioeconomic analyses. If major uncertainties are identified, the sensitivity of the analysis will be discussed.

Possible measures to mitigate socioeconomic impacts may be described in the EIS. Based on public input on the Draft EIS, these measures may be modified for the Final EIS. The Record of Decision will reflect DOE's commitment to certain mitigation measures.

The selection of a rail route in Nevada will consider economic, social, engineering, land use, and environmental factors. The EIS will either describe the criteria and rationale used to select the route.

2.2.20 Accidents

Issue Summary Twenty-five (25) people commented on accidents. These comments are summarized in Appendix A, Table A.20. Specific concerns were the identification of credible accident scenarios including analysis of an accident involving terrorist attacks or sabotage, the potential risk to the public from an accident, identification of evacuation routes, cleanup after an accident, impacts on the tourism business, and compensation for accident victims.

General EIS Approach The Repository EIS will identify a set of credible accident scenarios to evaluate. Accidents that could occur during the transportation phase, the construction and operation of the repository, and the post-closure phase will be assumed. For the post-closure phase, the principal accident initiators that will be considered are natural phenomena (e.g., a design basis earthquake). The suite of accidents to be evaluated will include a low probability, high consequence event to bound the potential environmental impacts. The impacts to the worker, maximally exposed individual, and off-site populations will be assessed. Intruder scenarios to be evaluated during post-closure will be those consistent with Nuclear Regulatory Commission requirements as described in Section 2.2.15.

2.2.21 General

Many commentors provided views and comments that were not related to the scope of the Repository EIS and therefore could not be used to guide the preparation of the EIS. These comments are summarized in Appendix A, Table A.21. While these comments provide a gauge of public sentiment on the program, they were not related to the content of the proposed action. Examples of comments that were placed into this category include: statements both in general opposition to and in general support of Yucca Mountain, repositories, and nuclear power; statements of distrust of the DOE or project opponents; opposition to transporting radioactive material; stated preferences for DOE to select the "No Action" alternative (absent of any environmental analysis); comments directed toward the public criticizing a perceived lack of the

public's willingness to be involved; criticism and support for the NEPA process; comments on unrelated DOE activities; and, criticism of DOE and that decisions had already been made prior to the NEPA process.

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